User Manual KaaS

v1.0 December 2022

Interface Specification

The 2021 (December) release will provide the capability to selected IEEE volunteer members to develop their "Knowledge Map", to identify education content to expand their knowledge, and to explore Knowledge related to their Knowledge Map.

The identification of the members is done through the IEEE single sign-in page and authentication procedure (to facilitate testing of the prototype also by non IEEE members, a simplified procedure not requiring access to the IEEE single sign-in has been implemented). Once authenticated the user is entered into Basic Exploration Mode. This is the only mode available for "guest users", users that are not IEEE members and that will need to register, at regime, through a specific procedure.

Users who already have a Knowledge Map created are presented with the display of their Knowledge Map and the choice of moving into Learning Mode or Exploration Mode. The default mode is Input Mode.

In the following each mode is described. It is possible to swap to a different Mode by clicking on the related button (the buttons for Learning Mode and Exploration Mode are activated once at least a Knowledge entity has been created).

The interface provides "at a glance" information on entities that can be explored. Different graphical icons are used to represent:
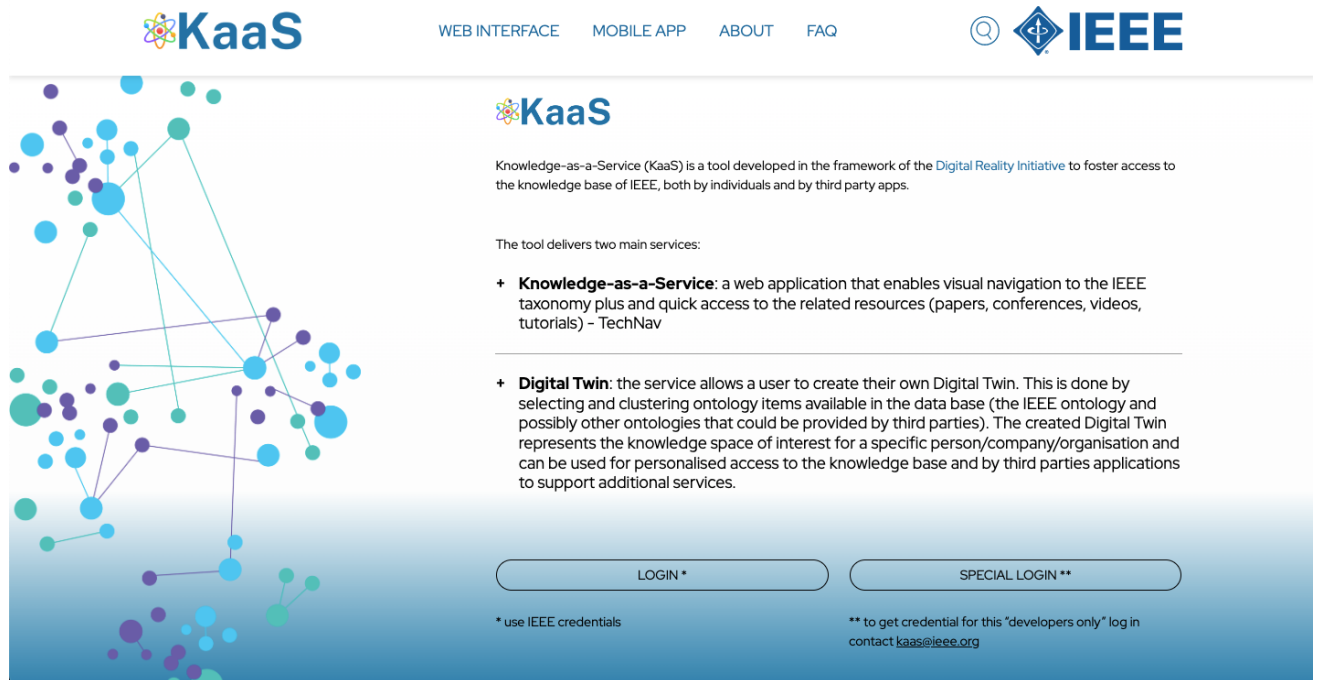
- Knowledge (owned Knowledge has a green contour, available not owned knowledge has a reddish contour whose depth and intensity is related to the quantity of unknown knowledge compared to the one known).

- Education (colour coded for "courses", "articles", "tools", "experts", "companies")

With the exception of the Basic Exploration mode, the screen is divided in a vertical band on the left hand side containing various commands and in three horizontal bands, the central one being the one controlled by the user. The upper and lower band are created by the KaaS and represent, respectively, the application areas for the knowledge displayed in the central band and the underlying knowledge that provides the foundation of that knowledge.

Lines are used to connect entities and are generated by the tool. Their meaning depends on the Mode.

Visit https://kaas.ieee.org, by clicking on «LOGIN» you can use your credentials to access KaaS. IEEE members can use their IEEE credentials.
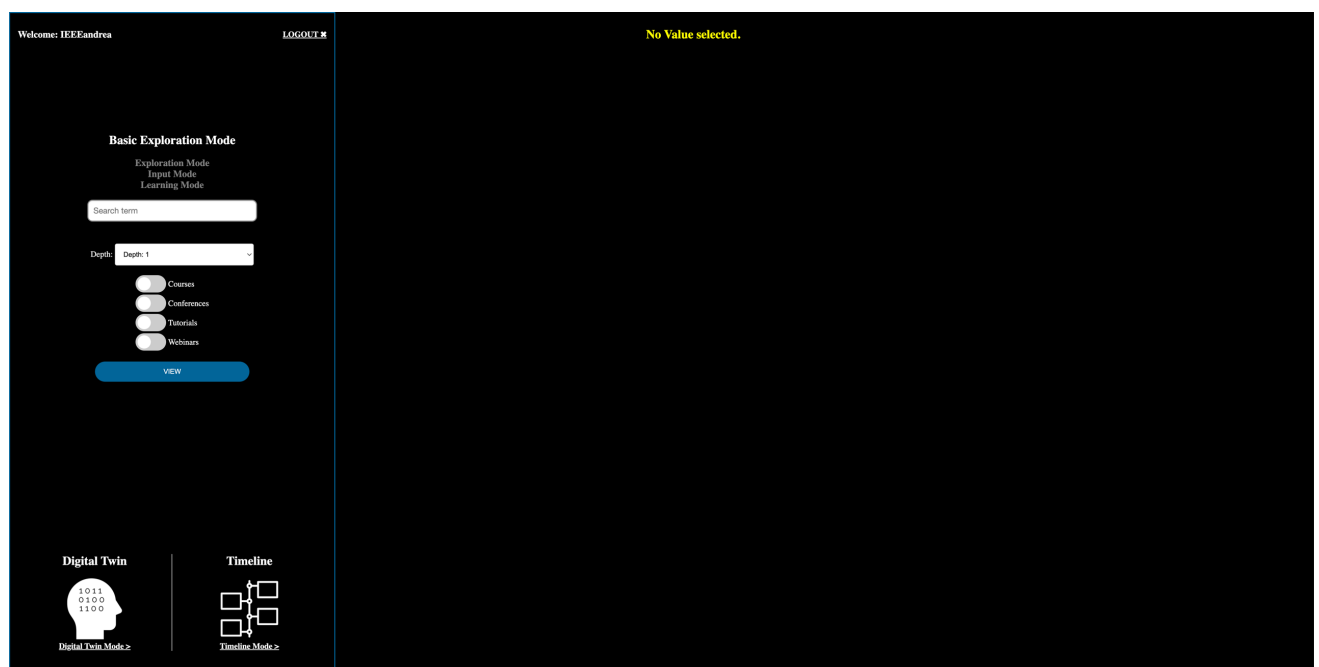

This is how the Dashboard will looks like:

As you can see you have two different mode: **Basic Exploration (1)** or **Digital Twin (2)**:
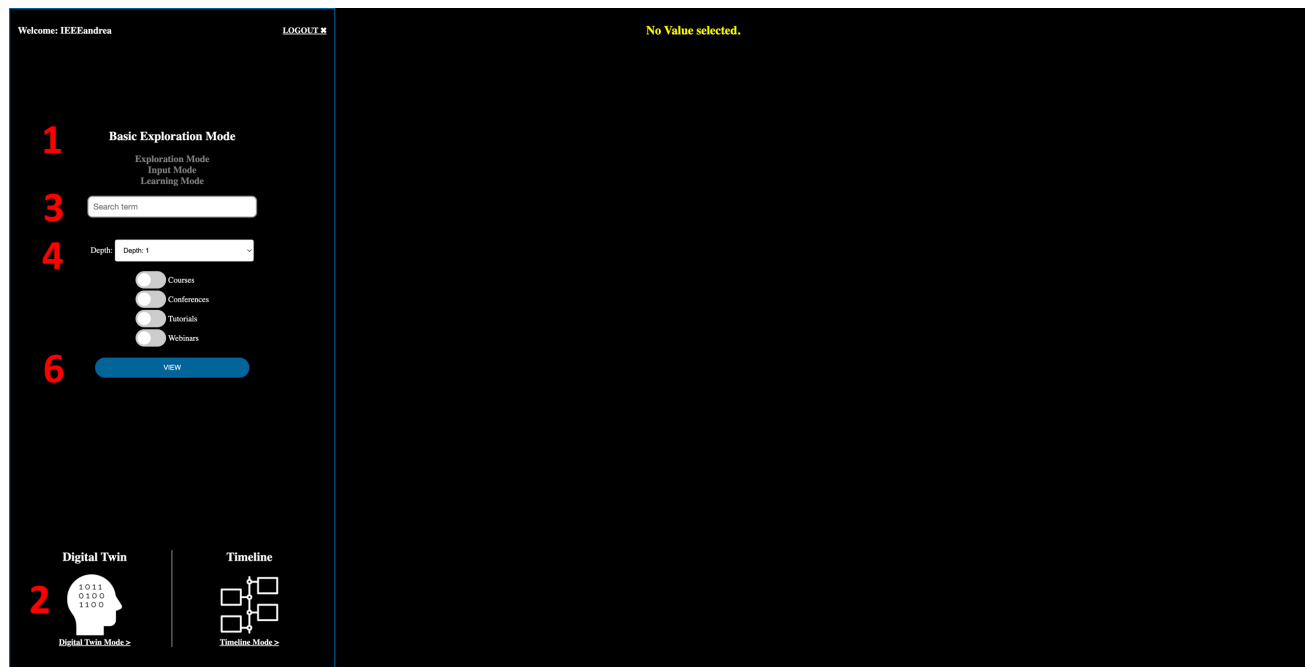
Basic Exploration Mode

This mode is providing a way to access the IEEE knowledge and it is based on the IEEE ontology supplemented by all courses, conferences, tutorials, webinars that are available.

This mode can be accessed by anybody. Access to the other modes requires the authentication through the IEEE single sign in. If a user has not signed-in the button to activate the other modes are dimmed.

In this mode you can search for a knowledge item -K.I- **(3)**. Knowledge is organised in connected items at different layer (a K.I. can be composed of parts: these are part of the next lower layer) It is possible to choose the depth of the search, 1 or 2, to indicate the number of layers to be considered **(4)**.

The **Depth** is dictating the number of levels that are shown with respect to the Root. By default Depth is set to 1, meaning that only those ontology elements directly connected to the root are shown.

In principle depth can be set to any number and all layers up to that number will be rendered in the graphic. In practice, most roots are connected to many entities and as the Depth number increases the displayed graphics soon become overcrowded/cluttered and difficult to understand.

Notice that the use of a 3D visualization device, like an Oculus Rift, might provide a better way of navigating through a complex mesh of entities and in this case more depth layers might become manageable.

Courses displays the courses offered by IEEE on that particular Root.

Conferences display IEEE conferences addressing that root. In case a conference has already taken place the link points to the conference acts, otherwise to the conference website.

Tutorials display IEEE conferences addressing that root. Only tutorials that are scheduled in the future and those that are available on line are presented.

Webinars display IEEE conferences addressing that root. Only webinars that are scheduled in the future and those that have been recorded and are available on line are presented.

NOTE: the above information is shown in the prototype as examples that have been created manually. Automatic creation of pointers will be addressed in 2021.

The search and navigation takes place on the available knowledge space At this time this space contains the IEEE ontology, over 11,000 K.I..

To make your first search start typing the K.I. you are looking for. KaaS will suggest all terms related to the one typed and you can choose one among them by clicking on it **(5)**.

Then you can select the Depth and click View **(6)**.
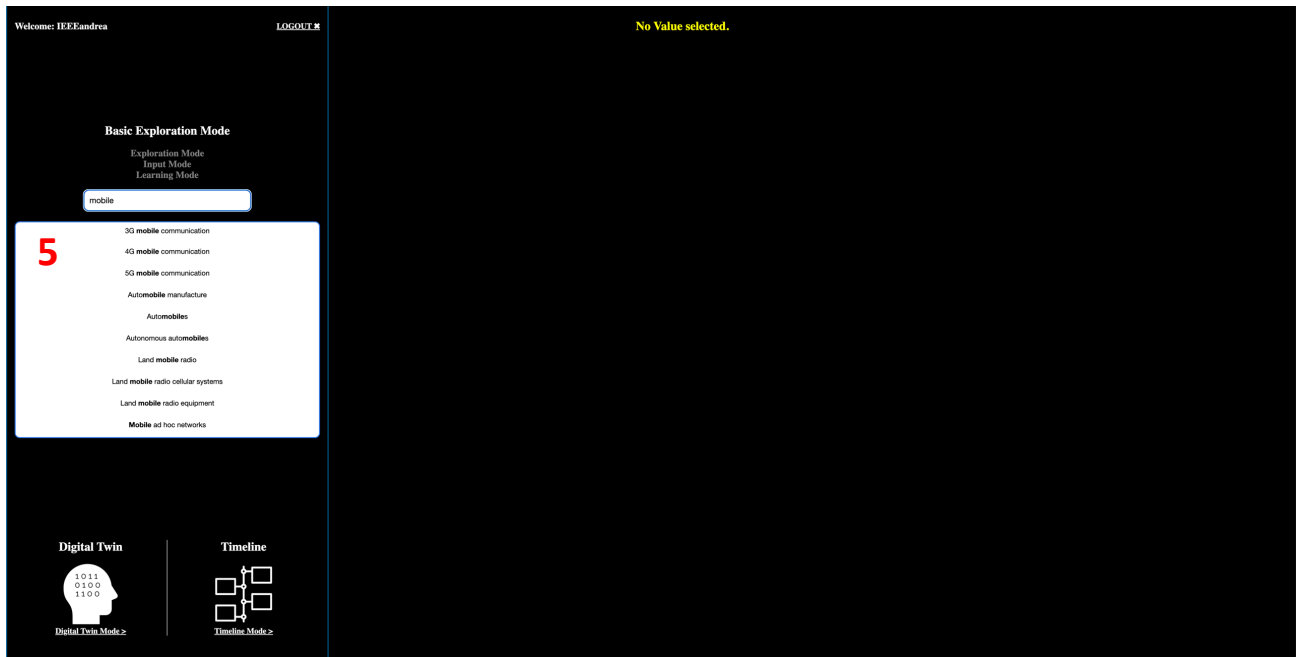
This is how the result of the research will looks like. In orange you fill find the main subject and in green the related ones. Orange represents the branches and green the leaves of the knowledge map's tree.
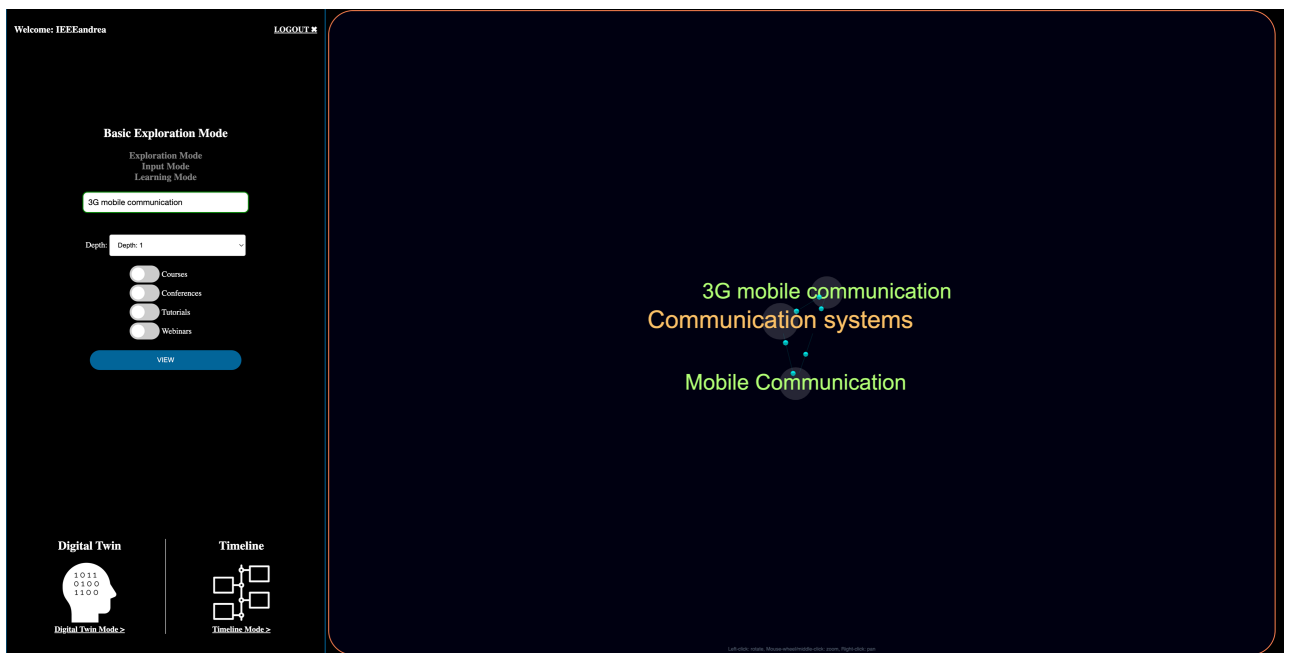
Unrecognised search item

If the term(s) in the Query space is not present in the IEEE Ontology Data base, nor it is recognised as a synonym, the user is prompted with the request to explain the term. An editorial team will check for:

1 – the existence of an equivalent term, in which case the query term will be included in the synonym list
2 – the absence of an equivalent term and the need to insert the query term in the ontology since it is addressed within the IEEE knowledge space
3 – the absence of the semantic concept in the IEEE knowledge space.
In all cases the user will be informed of the resolution taken by the editorial board, provided the user has signed in or has provided the needed contact in the explanation of the term.

This feature will be particularly useful in the crowd-checking of the ontology.

If you want to know more about a certain term you just have to click on the word with the right button of your mouse. This will open a new tab in wich you can see all the links IEEE has in its datatbase.
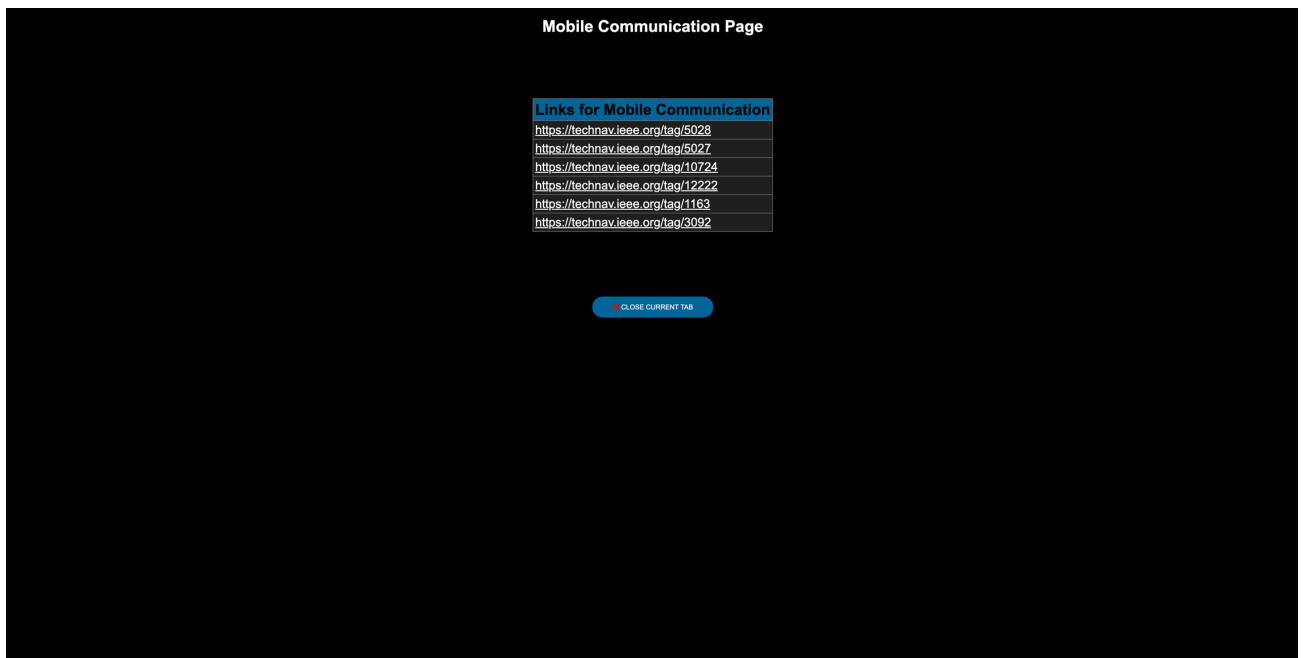

Digital Twin

In this mode you can search for a term like you did in Basic Exploration, but you can add a certain skill to your Digital Twin.

The Digital Twin will contain all the terms (skills) you have searched for and in the future you will see them connected as branches and leaves.

In this way you have the chance to look at your personal knowledge map and also navigate trough it.

This is how the Dasboard of Digital Twin looks like:
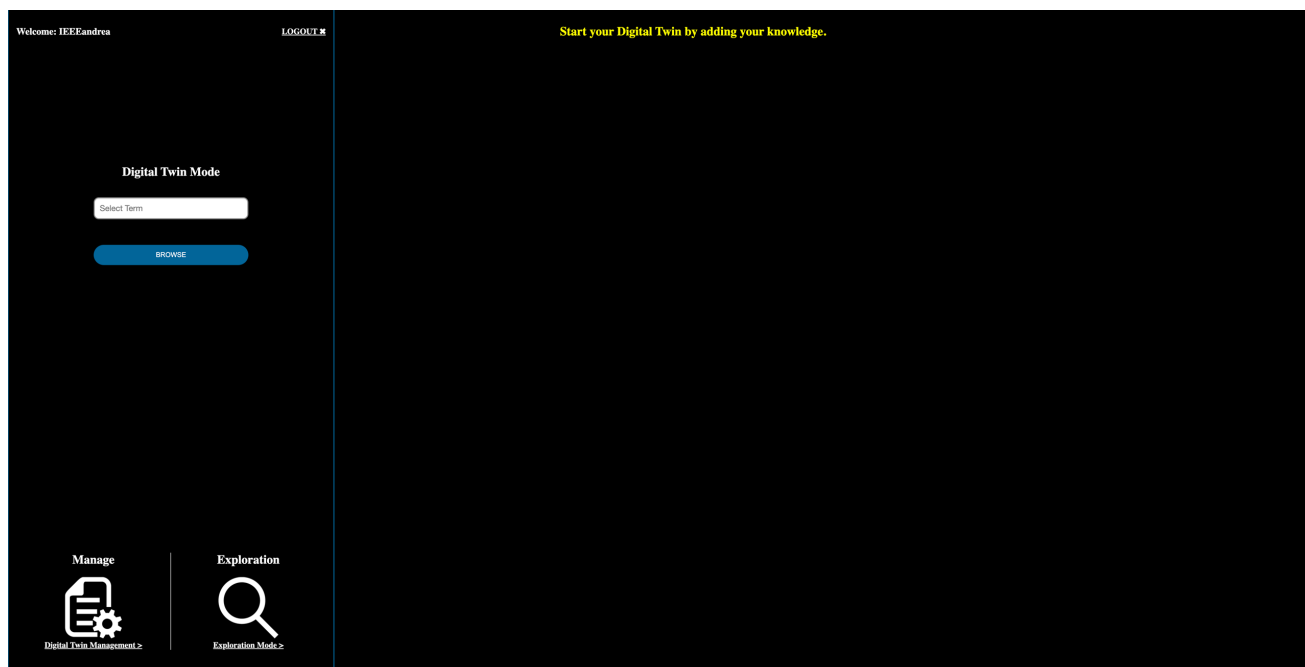
You can search for a term **(7)**, always clicking on it from the dropdown menu, and this will be the result after you press Browse button **(8)**: you can see a table with some elements we are going to explain in the next page.

Elements of the table:

- Magnifying glass **(9)**: since this table will not show only the term you searched for, but also his branches and leaves, you might want to navigate trough other terms, suggested because connected to the one you was looking for;
- Sum Symbol **(10)**: if you think you master a certain skill you can press the icon and add it to your personal Digital Twin;
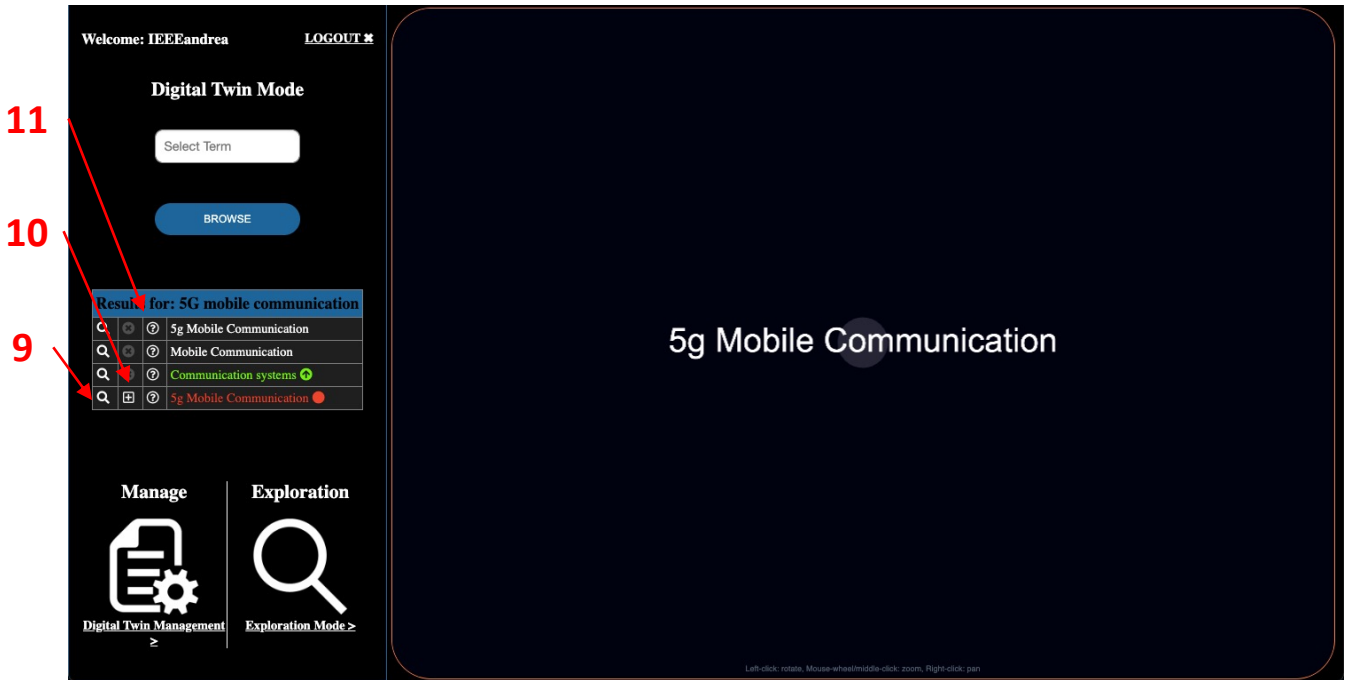
- Question Mark **(11)**: since this table will not show only the term you searched for, but also his branches and leaves, you might want to deepen the topic. You can click on the icon and you will be redirected to a new tab where you can find more information about it, for example you can click on Wikipedia's link;
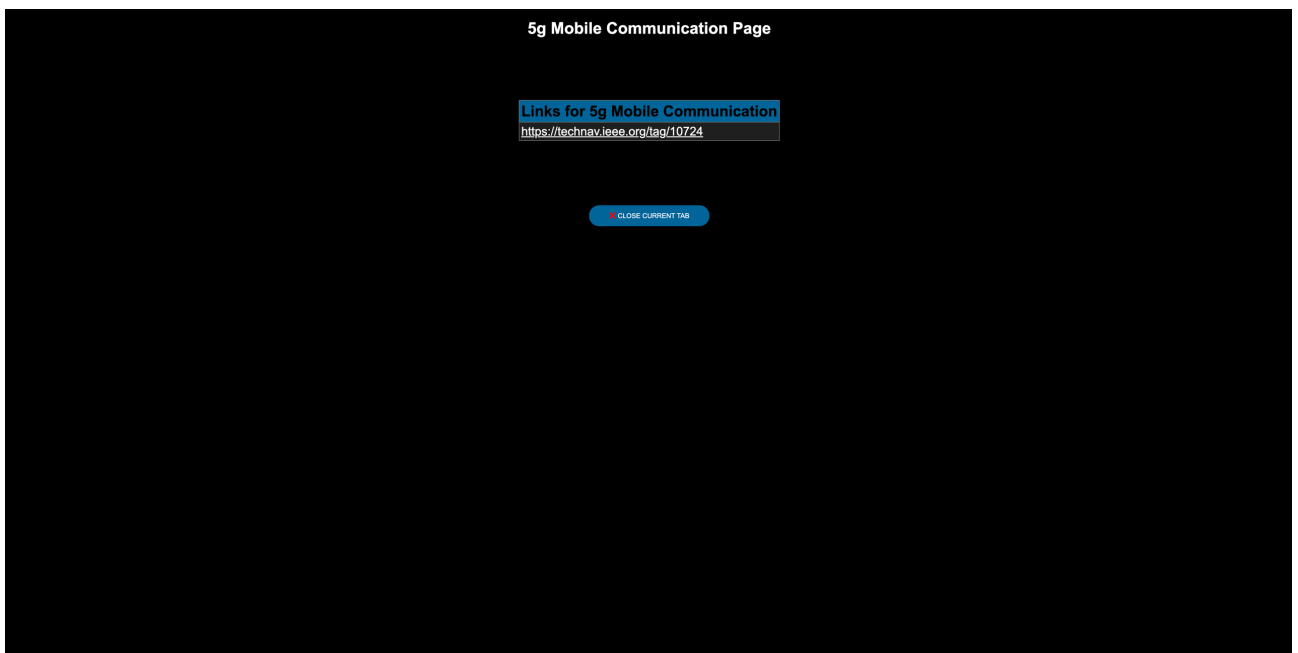
- White color: you will find only one word in white, this is the one you searched for;
- Red Color: This is a leaf, in this case you fill find it in red (and not in green) to help you understand this is and end point, you will not find any other term/topic/skill connected to that term walking down trough the IEEE's knowledge map.
- Green Color: This is a branch, in this case you will find it in green (and not in orange) to help you understand you can go up trough the IEEE's knowledge map, you will find other term/topic/skill connected.

By clicking on Manage Digital Twin you will find a table containing all the skill you added to your Digital Twin, with a trash icon on their side **(12)**. Here you can delete skill you don't want anymore to be part of your personal knowledge map.

This is how it will looks like your personal knowledge map after you add few skills: